

A STUDY OF RISK ASSESSMENT IN THE CITY OF SANTA ANA

**EXECUTIVE ANALYSIS OF FIRE SERVICE OPERATIONS IN EMERGENCY
MANAGEMENT**

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ABSTRACT

The problem was that the City of Santa Ana Fire Department had not developed a consistent, inclusive and reliable mechanism for conducting fact based risk assessments. Although many programs had been developed to meet emergency response needs, the programs did not align with risk assessment results.

The purpose of the research project was to describe current risk assessment efforts, risk assessment that was already underway or completed as well as review standards and programs that might have assisted in creating a formal risk assessment program.

Descriptive research methods were incorporated in answering the following questions:

1. What are some of the available tools to conduct professional risk assessment?
2. What tools has the City of Santa Ana Fire Department utilized to assess risks within the City?
3. What challenges does the Emergency Management team continue to face in conducting meaningful risk assessment and applying established programs?

The procedures used in the project included literature review and personal interviews. Results indicated mandates as well as support for the development of a risk assessment program. The results also indicated that several National Fire Protection Association standards could be utilized as benchmark documents.

Recommendations made were to begin at the beginning by defining parameters and purpose of a proposed program, form a citywide emergency management team to work within those parameters, begin to assess risks, begin to refocus funding to identified risks/hazards and develop monitoring for future updates.

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INTRODUCTION

“To know where you are going, you have to know where you are” (Risdon, 1989 p.31). In the City of Santa Ana what we know is that we are the County seat and that several government agencies are within our downtown Civic Center boundaries (view Appendix A). We know that Southern California has experienced five major earthquakes with magnitudes exceeding 4.8 since 1932 (California Department of Conservation, 2002). We also know that we have many historical buildings including a historic downtown district in various stages of fire protection and earthquake retrofit stages. We have forty high rise buildings; fourteen of which are not fire sprinkled. The City has over six hundred businesses that utilize hazardous materials in varying quantities. The City has a resident population of over 320,000 and a day time population of nearly 400,000 within 27.5 square miles. These are just a few of our more obvious risks that merit quality risk assessments.

What we’re unsure of is the best way to conduct a risk assessment that pulls together the threat of conflagration, terrorism, earthquakes and hazardous materials. And whether our current assessment measures have produced relatively empirical data or simply represent gut instinct. Also we are concerned that our current programs designed to assist in responding effectively to emergencies don’t tie together well.

The problem is that the City of Santa Fire Department has not developed a consistent, inclusive and reliable mechanism for conducting a fact based risk assessments. Although many programs have been developed to meet emergency response needs, the programs are not aligned well with risk assessment results. The

Emergency Management Team recognizes the need to bring it all together in a risk assessment program.

The purpose of this research project is to describe the current risk assessment efforts that are underway, risk assessment already conducted and documented in some fashion, as well as the programs and policies that have resulted with or without the benefit of assessment. Also, I intend to propose some recommendations to enhance the current efforts.

Descriptive research methods have been chosen for this applied research project in an effort to answer the following questions:

1. What are some of the available tools to conduct professional risk assessments?
2. What tools has the City of Santa Ana Fire Department utilized to assess the risks within the City?
3. What challenges does the Emergency Management team continue to face in conducting meaningful risk assessments and applying established programs?

BACKGROUND AND SIGNIFICANCE

In recent years the State of California and the Federal government has introduced a plethora of legislation and policy to mandate and encourage local authorities to prepare, to become proactive in preventing, mitigating and lessening the impact of various potential emergencies. The recommended policies and procedures come in many forms and are concerned with many emergency situations. For examples, earthquake preparedness data arrives via uniform codes, the Office of Emergency Management (OES), the Department of Conservation as well as the U.S. Department of the Interior. This is not to speak of the oldest threat of conflagration

and the newest threat of terrorism. Natural disaster and plain old fires have become a catch as catch can issue taking a back seat to the most current risk potentials of terrorism and weapons of mass destruction (WMD).

In this whirlpool of meeting mandates, desiring quality assessments, and understanding limited resources the Santa Ana Fire Department has come at the problem from different directions and struggles to connect the efforts into meaningful assessments, policies and training programs. The *Community Risk Assessment chapter #4 in the EFOP Executive Analysis of Fire Service Operations in Emergency Management* (EAFSOEM) student manual discusses the need to involve the community as well as multidisciplinary agencies; that we are not isolated within our communities. The Santa Ana Fire Department understands that need and participates in a variety of forums to share information and gain cooperative and mutual aid. The Department currently has three Administrative Captains on a forty hour work week schedule. One is responsible for obtaining Federal grants for terrorism preparedness, designing and implementing the program. Another is responsible for enhancing and maintaining the city Emergency Operating Center (EOC). He also must develop training and conduct drills for city employees and EOC management teams. And the third Captain is responsible for the citywide Community Emergency Response Team (CERT) program. The Department also has a fully staffed Hazardous Materials Response Team with a compliment of Bureau staff inspectors that gather and provide the team with Business Emergency Plan (BEP) information.

Although it appears that the Department is well armed with the appropriate players in planning and preparing for disasters these Captains are teams of one with a

common goal; to react appropriately utilizing an efficient and effective EOC, field training and citizen participation. They are fully aware that the response component is well on its way to meet the needs of the City as well as a regional participate. They are also aware that when the efforts are based on more gut instinct, past experiences and perceived disasters they beg the question: should we be directing our efforts to results of a thorough citywide risk assessment and if so how should that assessment take shape?

As mentioned above these Captains participate in a variety of forums that speak to the larger County and Statewide emergency response challenges that local jurisdictions can draw from. Each of these Captains has been interviewed for this research and their input will be more fully discussed in the procedures section. The terrorism Captain is working with a Federal grant to develop county wide plans and to annex these plans into the County Emergency Area Plan. The Orange County team has conducted a risk assessment utilizing Federal Emergency Management Agency (FEMA) guidelines as well as California OES guidelines. The Civic Center is considered number three in a list of potential risk for terrorist acts behind only Disneyland and the County airport. As the reader will discover in the interview with Captain Mark Eide he does have some concerns as to how the team arrives at such assessments.

The CERT Captain has very recently developed a citizen training program in the City and is aware that those neighborhoods surrounding the Civic Center may have different threats and aftermath issues that other neighborhoods and will need to be trained to deal with them as a community group. Captain Dave Thomas recognizes

that with time his trained community may be able to assist in the EOC, on the street and in refuge centers. Without risk assessment he would be gauging from past experiences what types of training the community needs as well as what areas of the City may need assistance. They wonder if we have “the cart ahead of the horse”.

And finally Captain Randy Black, in charge of the EOC understands that the EOC is on the fringes of the Civic Center, not far from the downtown area and that many Civic Center employees serve as the staff to the EOC while also working in a very vulnerable location. They will also require specific training to effectively evacuate and safely arrive for their prescribed duties. This team more than any other will need to fully understand the risks their community may face at any time as they will ultimately decide where the City’s resources will go during a critical emergency.

This applied research project is relevant to the EAFSOEM course in emergency preparedness, community risk and capability assessments and emergency response strategies.

LITERATURE REVIEW

The literature review is a concerted effort to gather documents, standards, and research created by others that are relevant to the project subject. The ultimate goal is to glean information that will assist the Santa Ana Fire Department in the development of a risk assessment program.

There are several National Fire Protection Association (NFPA) standards that reference risk assessment as well as risk management. NFPA 1201 *Developing Fire Protection Services for the Public (2000 edition)* mandates risk assessment but does not provide a guideline. The recommendations in this standard are more focused on

the day to day fundamental activities of risk assessment and reduction through educating the public, conducting fire inspections and utilizing incident records to identify trends or commonly occurring fire issues.

This standard defines the concept of risk as:

The level of service provided and the degree of risk accepted by the jurisdiction shall be subject to local determination. There is a fundamental concept of risk associated with modern society. Public fire service organizations are expected to reduce the risk within their areas of jurisdiction by taking measures to prevent the outbreak of fires, to limit the extent and severity of fires, to provide for the removal or rescue of endangered persons, to control and extinguish fires that occur within the jurisdiction, and to perform other emergency response operations and delivery of emergency medical services. The cumulative effects of preventive efforts, risk reduction and control, and fire suppression capabilities result in variable levels of risk to the jurisdiction and their residents. The risk remaining after deducting the cumulative effect of the public fire service organization's efforts is the responsibility of each individual, including owners, operators, occupants, and casual visitors to properties. It should be noted that fire risk cannot be completely avoided or eliminated.

Although this standard does not prove valuable as a guideline it does beg the question concerning why we might choose to conduct risk assessments, for what purpose and to what degree. This standard offers several options; to deduce risks by jurisdiction statistics, to reduce risk by providing inspection services while identifying target hazards, to effect risk by educating the public as to their role and responsibility toward

fire safety or to conduct actual risk assessment studies designed on the principles posed in this standard.

NFPA 1250 *Recommended Practice in Emergency Service Organization Risk Management (2000 edition)* outlines an entire risk management plan. It is to assist users to reduce the risk to an individual, the emergency services as well as the jurisdiction. This standard describes the fundamental concept of risk much the same as NFPA 1201 as discussed above. Where it varies and is most useful to this research are the guidelines provided to assess liability and aftermath concerns. The standard encourages risk assessment by weighing the relative significance of each type of risk based on more than just fire potential. It adds elements such as general liability, worker's compensation, property loss potential, criminal activity, environmental liability to mention a few. These concepts can be an integrated component in a risk assessment study more pointed to a jurisdiction's emergency management members from risk management and finance departments. These departments or at least professional representatives are members of the California Incident Command Systems; Standardized Emergency Management System (SEMS) emergency management team during major events.

NFPA 1600 *Standard on Disaster/Emergency and Business Continuity Programs (2000 edition)* provides guidelines relating to preparedness for, response to and recovery from disasters. This is the first NFPA standard that categorizes possible emergencies related to nature, human action or technology. This edition is expanded to include business continuity programs. Similar to the other two NFPA standard discussed in this study 1600 mandates hazard identification and risk assessment:

The entity shall identify hazards, the likelihood of their occurrences, and the vulnerability of people, property, the environment, and the entity itself to those hazards. Hazards to be considered as a minimum shall include, but not be limited to, the following: natural events, technological events and human events. This standard acknowledges that each entity is different therefore the level of the assessment will vary. However several representative agencies should be involved on any program development committee to include: fire, police, public works, risk management, finance, legal, public health, airport, port authorities and information services. The very baseline of the program should begin with identifying the range of possible risk that have or might impact the area.

The hazard identification and risk assessment determines “what” can occur, “when” (how often) it is likely to occur, and “how bad” the effects could be. For certain hazards identified, it will be determined after this preliminary analysis that it is not necessary to carry out a full analysis. These are hazards where no further action is required. NFPA 1600 provides lists of possible events to consider. The list is lengthy therefore can be viewed in Appendix B.

The standard also suggests some possible formats, methodologies or techniques to document the study that include but are not limited to the following:

- 1) What if
- 2) Check list
- 3) Hazop, hazard and operability study
- 4) Failure modes and effect analysis

- 5) Fault tree
- 6) Failure logic diagrams
- 7) Dow and bond indices
- 8) Event tree analysis
- 9) Human reliability analysis
- 10) Capability assessment readiness for state and local governments

NFPA 1600 also reminds us that the assessment does not end when the initial study is complete. It should be updated annually and re-evaluated if there are regulatory changes, new hazards introduced, organizational changes, infrastructure changes, funding and budget changes as well as after drills, tests and exercises.

Finally this document recommends that following the risk assessment study entity capability should be addressed as it pertains to each identified risk to include but not limited to communications, activating the EOC, mobilization of resources as well as resources themselves, displacing residence, displacing government, mental and physical health as well as entity recovery issues.

Currently there is a NFPA standard under develop, NFPA 551 *A Guide for Evaluation of Fire Risk Assessment (2002)*. This standard will provide guidance primarily for authorities having jurisdiction in the evaluation of the appropriateness and execution of risk assessment for a given fire safety problem. The proposed standard is expected to be released in March 2004.

Federal Emergency Management Agency (FEMA) *Bulletin #386-2 Understanding Your Risks* is a state and local mitigation plan how to guide. The impetus of the document is the Disaster Mitigation Act of 2000 that encourages and

rewards state and local agencies in pre-disaster planning. The bulletin speaks to the second component of a larger series following *Organize Resources* and preceding *Develop a Mitigation Plan* and *Implement the Plan and Monitor Progress*.

Understanding Your Risk is further broken down into four segments: identify hazards, profile hazard events, inventory assets and estimate losses. This is a step by step guide contained in approximately one hundred and twelve pages. The description of each of the four components within *FEMA Bulletin #386-2 Understanding Your Risks* can be viewed in Appendix C.

The final document offering tools to conduct risk assessment is the *National Fire Academy EAFSEOM classroom manual Chapter #4* (2002) offers several forms and matrixes to identify risks, the community's vulnerability to them, and probability of the risk. The formulas are easy to understand and allow for differentiating between those events that the entity is always capable of handling and those that may take more or different resources. An important component in this document is the discussion on the dread factor and ways to qualify or disqualify it as a real threat. These are the events that have little to do with an actual impact on the community but are a matter of public perception. According to this document, the dread factor is a component that should not be ignored.

PROCEDURES

The purpose of this research project was to describe the current efforts in risk assessment within the Santa Ana Fire Department as well as discover available tools, methods and ideas to conduct a professional risk assessment. Descriptive research and

information collection began with three interviews. Each interview was approximately one hour in length. The purpose of the interviews was to discuss awareness of possible tools to conduct risk assessments, current efforts underway in assessing risk, results of any efforts as well as opinions about where the department has been with emergency management as it pertains to risk assessment and where does the interviewee see the effort going next.

The author interviewed Captain Mark Eide on January 15, 2003 at fire administration. Captain Eide is an administrative Captain in charge of developing training programs for Weapons of Mass Destruction (WMD), Metropolitan Medical Response System (MMRS) and general terrorism issues. He serves on the countywide committee that is creating the terrorism component for the Orange County Emergency Response Plan. When asked what type of risk assessment has taken place within the county group Captain Eide explained that much of what is discussed is the dread factor (perceived risks) and then actual risks. Actually, the evaluations were subjective and were based on logic more than threat data. They utilized tools provided to them by the California Office of Emergency Services. Mostly the questions on the tool were concerned with locations that members of a community feel passionate about, locations that have strong religious meaning, locations that may be dominantly governmental, infrastructures, entertainment and anything symbolically American . Captain Eide also said that jurisdictions clamor for precious federal and state dollars so the countywide forums work well in covering regional as well as local issues thereby making everyone's job a little easier. However on the flip side is each agency desires to have their needs met above all else so it begs the question as to whether

perceived threats are weighted equally. After discussing the possible standard and documents that could be utilized to weigh things out on an even plain Captain Eide commented, "That would be great; I wonder how long it would take us to choose the "right" system." When asked if he was aware of any current efforts being made in Santa Ana to assess risk overall he explained, "There is always discussion about our target hazards and the threats they present. We are fully aware of our capabilities and the areas that we will need mutual aid but there is no formal mechanism utilized that addresses the kind of assessment you are referring to." As mentioned in the background and significance our Civic Center has been named number three in the Orange County. Captain Eide explained that it is the only civic center in the county that houses every level of government from immigration to City Hall. It is an area of passion as well as an area of potential. Captain Eide also felt that the process of risk assessment would be made easier if communications with law enforcement were improved. There is a lot of information every day and deciding who needs to know has become very challenging.

The author interviewed Captain Randy Black on January 17, 2003 at fire administration. Captain Black felt that we do a fairly good job at recognizing our risks. He was not aware of any formalized risk assessment going on within the department, but he stresses formalized because we have guidelines and procedures to assist us with a variety of emergency responses. Terrorism of course being the latest edition, but will be added to the County Emergency Response Plan shortly. Captain Black is in charge of the EOC and the drills necessary to keep the emergency management team skills up. When asked if he felt that the EOC team understood all of the various risks he

claims that many do especially those involved in risk management as it relates to finance and insurance. When asked would it be helpful if the risks were prioritized by probability and degree he says, "Sure, it would make it easier to establish where new dollars need to be spent and the existing resources directed." He feels that we have a pretty good feel for it and some times empirical data isn't available, such as absolute threats of terrorism. The author inquired as to whether Captain Black felt that we tie his efforts together sufficiently with the Community Emergency Response Team. He says, "The CERT program is so new, but the wish list would include discovering citizens that could gain the skill levels to be utilized in the EOC and in citywide planning for disaster preparedness." When asked if he would be interested in choosing a mechanism to conduct a city wide risk assessment he says, "Absolutely, but first we have to decide what a citywide assessment would consist of, at what level and how far reaching with the understanding that the definition of risk assessment is wide ranging, with everything from do we have the right firefighting tools for every high rise in the city to the probability of a terrorist act upon the Civic Center." Captain Black suggested that communication between agencies within the city and county could be better. He also felt that some strategy efforts need to come out of the management staff to get us headed down the same road.

The author interviewed Captain Dave Thomas on January 20, 2003 at fire administration. This interview was more of a general conversation concerning the CERT program and how it might be influenced by a quality risk assessment. Captain Thomas felt that anytime we can pin down a prevailing issue such as earthquake always being a matter of when not if, we are ahead of the game in training the public.

It's the more difficult issues such as terrorism that are hard to train for. The CERT program hits on all of the emergency techniques that we may want our citizens to participate in such as securing their neighborhoods in place with plenty of supplies, CPR training and general first aid. When asked if he thought we could eventually utilize the CERT graduates in the EOC and perhaps in risk assessment he stated that that had been discussed and remains to be seen as the program is so new. When asked what challenges he believed that the emergency management team still faced he commented that more open communication would go a long way in assessing risks. Primarily it is an issue of planning for the inevitable terrorist threats.

All of the interviewees reminded the author about risk assessment that had been done as it relates to hazardous materials and are housed in our Santa Ana Hazardous Materials Area Plan. This plan discloses our worst target hazards because of their quantities, processes, nature of their business or the potential risk their particular chemicals pose to the public.

The second phase of the research and data collection was literature review. The research was descriptive in nature as it describes some of the available tools to create a risk assessment program. Four NFPA Standards, one federal bulletin and the EAFSEOM course manual were reviewed.

Assumptions and Limitations

An assumption was made that each of the interviewees understood the level in which we spoke of risk assessment. That they and the author were speaking of an overall community assessment of natural, technological and human risks.

Also, as is rarely the case, there is an inordinate amount of information concerning risk assessment, risk analysis and risk management that it was difficult to narrow the subject down to discovering available tools, discussing how the Santa Ana Fire Department believes that we currently assess and ultimately proposing a path to follow. The author could have discussed in intricate detail dozens of risk assessment options, samples of risk assessments as well as professional opinions on how risk assessment should be conducted but the document would prove to be unwieldy.

A self imposed limitation was the author's decision not to conduct surveys within the department or at surrounding departments. Discussion throughout the project led the author to believe that risk assessment is interpreted in many ways therefore surveys would serve no purpose but to convolute the effort in Santa Ana. The author also realized that a brainstorming session within the department would have to be conducted just to reach consensus how what risk assessment means to the jurisdiction and define what purpose it would serve prior to survey development.

Definitions of Terms

Regional. The State of California has been divided into six mutual aid regions. The purpose of a mutual aid region is to provide for more effective application and coordination of mutual aid and other emergency related activities.

Standardized Emergency Management System (SEMS). A system required by California Government Code 8607(a) for managing response to multi-agency and multi-jurisdiction emergencies. SEMS consists of five organizational levels which are activated as necessary to include field response, local government, operational area, regional and state.

RESULTS

The results of the literature review provided the following answers to research Question 1:

What are some of the available tools to conduct professional risk assessments?

NFPA 1201 *Developing Fire Protection Services for the Public (2000 edition)* provides a mandate for risk assessment. The standard focuses on more grassroots activities to assess risk such as fire inspections and statistic analysis of incident. This standard recommends sharing responsibility with businesses and citizenry for fire management through fire service training and educating efforts. This is a field approach to assessment with some public relations folded in.

NFPA 1250 *Recommended Practice in Emergency Service Organization Risk Management (2000 edition)* provides an outline for a complete risk management plan. This standard offers a reduction in risk to the individual, emergency services as well as the jurisdiction. The standard may be utilized when a more in depth study of liability is desired. This clearly presents a more in depth assessment and may be too cumbersome for some jurisdictions but perhaps different departments can build from each others material to create several levels of risk assessment within one inclusive document.

NFPA 1600 *Standard on Disaster/Emergency and Business Continuity Programs (2000 edition)* offers the most in guidance that includes suggested hazards to target, likeliness of occurrences, vulnerability to names a few. Also this document suggests agencies that should be considered when developing the risk management

team. And finally, this document offers a plan design for maintaining and updating risk assessment plans.

NFPA 551 *A Guide for Evaluation of Risk Assessment (2002)* is still under construction but promises to focus on when it is and may not be necessary to conduct risk assessment. We can look forward to this resource in March 2004.

FEMA *Bulletin #386-2 Understanding Your Risk* state and local mitigation guidelines is a very friendly easy to read document. The document has several other FEMA documents that accompany it with regards to organizing resources, developing mitigation plans, implementing and monitoring. For a jurisdiction looking for an all encompassing guideline this series would prove valuable.

NFA *EAFSEOM manual Chapter #4 (2002)* is also part of a larger FEMA series that offers several forms and formulas to conduct quality risk assessment.

The results of the personal interviews provided the following answers to Question #2:

What tools has the City of Santa Ana utilized to assess the risks within the City?

The interviews disclosed that the tools are varied and equally come from various places. Captain Eide's involvement in countywide committee work for assessing terrorist risks was an effort to decide who got money when to advance their overall as well as individual equipment and training needs. The forms that were used were recommendations offered by the California Office of Emergency Services as well as the Department of Justice. The assessment of hazardous materials targets was a subject evaluation of known businesses, their processes and their potential to cause community harm. Captain Black and Captain Thomas disclosed that they were not

aware of any “formal” program that the City adopted and engaged in to conduct risk assessment. They all felt that so far, the department’s risk assessment had been based on gut instinct, past experience, known quantities and perceived threats.

The results of the personal interviews provided the following answers to Question #3:

What continue to face the Emergency Management team in conducting meaningful risk assessments and applying established programs?

The number one result was an issue of communications. All of the Captains felt that regardless of the areas that they specialized in, lack of communication was the biggest challenge. Especially with terrorism because the information is so guarded and is not always shared across police and fire lines. All the Captains felt a risk assessment program would be worthwhile but that definition and parameters need to be put to that term and appropriate players brought in to insure open communications and information sharing.

DISCUSSION

The primary focus of the research was to discover whether the Santa Ana Fire Department recognized a need for a formalized risk assessment program. Secondly, professional standards or programs might provide guidelines for creating a program. As a by-product to this research the department discovered that the programs already in place for emergency response are quality programs that need a more defined purpose.

The results of this study, specifically the personal interviews, provided support for the development of an assessment program. Although the support was not

resounding and indicated on the interview with Captain Eide, it does identify that much work has to be done to define the purpose and parameters of such a program. The most interesting conclusion that the author identified was the very professional and technical programs the Emergency Management team represented. All designed to respond effectively and efficiently in emergency events, yet not directed to any specific qualified or quantified issue.

The results of the literature review certainly provided numerous options and ideas to construct a risk assessment program. NFPA 1600 *Disaster/Emergency Management and Business Continuity Programs* appears to be the most beneficial as it provide specific guidelines to identify risks, evaluate risks, mitigate risks, direct, control and coordinate them. The FEMA *Bulletin #386-2 Understanding Your Risks* is an excellent and complete guide for assessing risk through identifying and profiling risk, taking inventory of assets and estimating losses.

The task at hand is for the jurisdiction to decide at what level they feel a need to assess risks. These documents provide several ways to come at the issue, from loss control to natural disaster potential studies.

RECOMMENDATIONS

The research results demonstrate a need for a risk assessment program. The larger question still remains as to what type, what format, what level of assessment will be done and by whom. Based on the literature review, personal interviews, and analysis of the results the following recommendations should serve as a foundation to develop a comprehensive program:

1. Convene the Emergency Management Team to define and set parameters for risk assessment.
2. Further create a citywide team to work within the defined parameters. The team should consist of City employees engaged in Emergency Management.
3. Conduct a comparative study on other City plans.
4. Begin the process of assessing potential hazards within the City.
5. Begin to apply budget funds toward identified risks/hazards.
6. Create an evaluative mechanism to update the plan as changes in budgets, social issues, and emergency event occur.

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Appendix A

CITY OF SANTA ANA CIVIC CENTER BUILDINGS

1. County Administration
2. County Assessor, Recorder, Tax Collector, Treasurer, Auditor
3. County General Services Agency
4. County Welfare Department
5. Santa City Hall
6. City Council Chambers
7. Santa Ana City Central Library
8. State Building
9. Orange County Court House
10. County Law Library
11. Federal Building
12. Federal District Court
13. Ronald Reagan Federal Courthouse
14. California Franchise Tax Board
15. Recreation Community Services

Appendix B

NFPA 1600 Listing of Hazard Identification Options

- (1.) Natural events
 - Drought
 - Fire
 - Avalanche
 - Snow/Ice/Hail
 - Tsunami
 - Windstorm/Tropical storm
 - Hurricane/typhoon/cyclone
 - Biological
 - Extreme heat/cold
 - Flood/wind driven water
 - Earthquake
 - Volcanic eruption
 - Tornado
 - Landslide/mudslide
 - Dust/sand storm
 - Lightening storm
- (2.) Technological events
 - Hazardous Material release
 - Explosion/fire
 - Transportation accident
 - Building/structure collapse
 - Power/utility failure
 - Extreme air pollution
 - Radiological accident
 - Dam/levee failure
 - Fuel/resource shortage
 - Strike
 - Business interruption
 - Financial collapse
 - Communication
- (3.) Human events
 - Economic
 - General strike
 - Terrorism
 - Sabotage
 - Hostage situation
 - Civil unrest
 - Enemy attack
 - Arson

Appendix C

Understanding Your Risks The Natural Hazard Mitigation Planning Process

Organize Resources

From the start, communities should focus the resources needed for a successful mitigation planning process. Essential steps include identifying and organizing interested members of the community as well as the technical expertise required during the planning process.

Assess Risks

Next, communities need to identify the characteristics and potential consequences of natural hazards. It is important to understand how much of the community can be affected by specific hazards and what the impacts would be for important community assets.

Develop a Mitigation Plan

Armed with an understanding of the risks posed by natural hazards, communities need to determine what their priorities should be and then look at possible ways to avoid or minimize the undesired effects. The result is a natural hazard mitigation plan and strategy for implementation.

Implement the Plan and Monitor Progress

Communities can bring the plan to life in a variety of ways ranging from implementing specific mitigation projects to changes in the day to day operation of the local government. To ensure the success of an on-going program, it is critical that the plan remains effective. Thus, it is important to conduct periodic evaluations and make revisions as needed.